



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11) EP 1 083 563 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
14.03.2001 Bulletin 2001/11

(51) Int Cl.7: G11B 23/03, G11B 7/00

(21) Application number: 99830572.6

(22) Date of filing: 10.09.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: International Consulting S.r.l.
20059 Vimercate (MI) (IT)

(72) Inventor: Perego, Luciano
20050 Mezzago (MI) (IT)

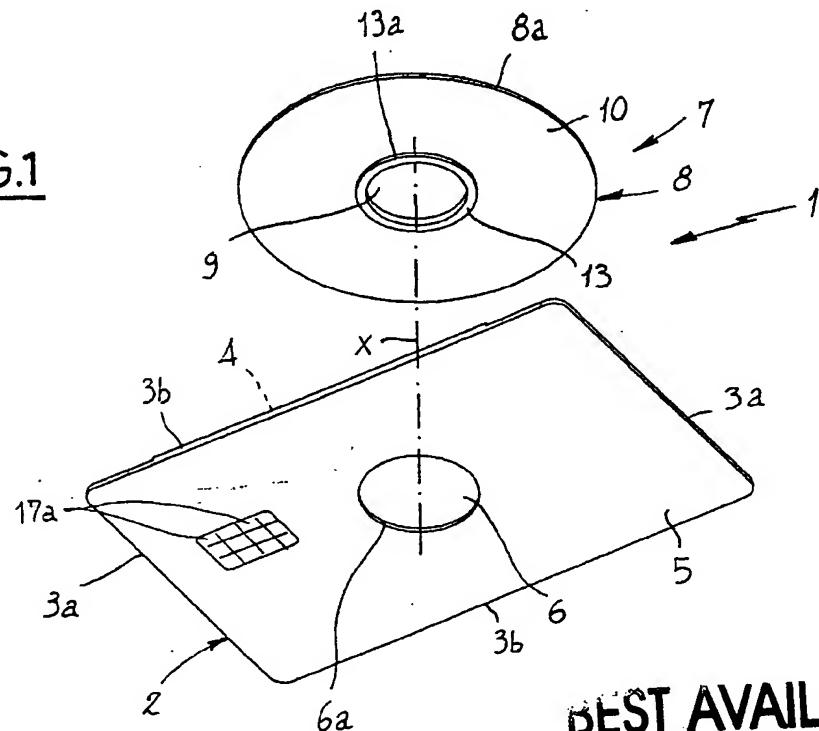
(74) Representative: Tansini, Elio Fabrizio
C/O Bugnion S.p.A.
Viale Lancetti, 19
20158 Milano (IT)

(54) Support card for data storage unit

(57) A support card for digital memories comprises a flat support (2) of standardized rectangular conformation, having a first face (4) and a second face (5) and being provided with a centrally-disposed through opening (6). Formed in the first face (4) is a surface recess

(11) for receiving a DVD disc-half constituting a first storage unit (7). A steady engagement of the first storage unit (7) on the flat support (2) is achieved by a collar (13) disposed close to a centering through hole (8) presented by the storage unit (7) and intended for coupling, by forced fitting, with the through opening (6).

FIG.1



BEST AVAILABLE COPY

EP 1 083 563 A1

Description

- [0001] The present invention relates to a support card for a data storage unit, of the type comprising the features set forth in the preamble of claim 1.
- [0002] It is known that there are different types of cards of standardized rectangular shape, usually used as credit cards or telephone cards for example, which are essentially defined by a plate-like or flat support of plastic material with a digital memory unit is as-sociated.
- [0003] In a first known type of card, the digital memory consists of a magnetic band extending over one of the two opposite faces of the flat body, parallelly to the subject card, to an enlarged scale relative to Figs. 1 and 2 and seen from the opposite side of one of the major sides of said body.
- [0004] In a second known type of card, the digital memory is essentially defined as "Smart Card", the digital memory is essentially made up of a microchip incorporated into the thick-tally made up one of the faces of the flat body itself.
- [0005] Also proposed in recent times have been cards of standardized rectangular shape in which the digital memory is of the optical type, i.e. of the type commonly utilized in manufacturing compact discs.
- [0006] Embodiments of these cards are described in Patent Applications JP 4040586 and WO 99/00765. Most dailies for accomplishing known cards having an optional memory and the consequent structure of same do not have important differences as compared with the features enclosed in a known card with an optical disc. In conclusion, a known card with an annulus substantially tangential to the port; is delimited by an annulus substantially tangential to the port; in which the area intended for data storage information, in which a different embodiment of a compact disc of rectangular formality consists of a compact disc of standard 1.
- [0007] Appropriate containing elements, embodied for example by ridges in the form of an arc of a circle or projections of different shapes are arranged on a read-seal.
- [0008] After the above statements, the Applicant has wished to analyse the possibility of providing a card with greatly improved versatility of use and memory capability to analyze the possibilities of providing a card with several memory units even of different types.
- [0009] In more detail, it is an object of the present invention to provide a support card for data storage unit, consisting of omitting, removing and/or replacing at least one of the memory units to be combined with the card itself.
- [0010] Further features and advantages will become part of claim 1.
- [0011] With reference to the drawings, a support card invention has been generally identified by reference numeral 1.
- [0012] Card 1 essentially comprises a flat support 2, preferably made of plastic material, having a perimeter edge through opening 3a and major sides 3b preferably of standard metal 1.
- [0013] The perimeter edge 3a, 3b delimited, on the flat credit card, ised sizes, corresponding to those of a conventional credit card.
- [0014] The first face 4 is aduanageously intended for carrying a first data storage unit 7, hereinafter referred to as first storage unit, circumferentially the through opening 6 has a geometric axis "X". Inter-centred position in the flat support 2, in more detail, es having a through opening 6 preferably disposed at a support 2, respectively opposite first 4 and second 5 faces.
- [0015] The first storage unit 7 is preferably of a disc-shape, comprising the crossring point between the diagonals in the recangular configuration of the flat support 2.
- [0016] The second face 5 is aduanageously intended for carrying a second data storage unit 8, hereinafter referred to as second storage unit, circumferentially the through opening 6 has a geometric axis "Y". Inter-centred position in the flat support 2, in more detail, es having a through opening 6 preferably disposed at a support 2, respectively opposite first 4 and second 5 faces.
- [0017] After the above statements, the Applicant has wished to analyse the possibility of providing a card with several memory units even of different types.
- [0018] It is known that the three different types of cards of standardized rectangular shape, usually used as credit cards or telephone cards for example, which are essentially defined by a plate-like or flat support of plastic material with a digital memory unit is as-sociated.
- [0019] This description will be taken hereinafter with reference to the accompanying drawings, given by way of non-limiting example, in which:
- [0020] Fig. 1 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0021] Fig. 2 shows the card in Fig. 1 with the optical memory unit mounted on the flat support;
- [0022] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0023] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0024] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0025] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0026] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0027] Fig. 8 shows an alternative embodiment in respect of Fig. 7;
- [0028] Fig. 9 is a section taken along line IX-IX in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0029] Fig. 10 shows an alternative embodiment in respect of Fig. 8.
- [0030] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0031] Fig. 12 is a section taken along line XI-XI in Fig. 2, showing a different embodiment of the invention;
- [0032] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0033] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0034] Fig. 15 is a second known type of card commercially available.
- [0035] In a first known type of card, the digital memory consists of a magnetic band extending over one of the two opposite faces of the flat body, parallelly to the subject card, to an enlarged scale relative to Figs. 1 and 2 and seen from the opposite side of one of the major sides of said body.
- [0036] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0037] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0038] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0039] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0040] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0041] Fig. 8 shows the card in Fig. 4 in an assembled condition;
- [0042] Fig. 9 is a section taken along line XI-XI in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0043] Fig. 10 shows the structure of a flat support being supported card in accordance with the present invention;
- [0044] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0045] Fig. 12 is a section taken along line VII-VII in Fig. 2, showing a different embodiment of the invention;
- [0046] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0047] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0048] Fig. 15 is a second known type of card commercially available.
- [0049] In a first known type of card, the digital memory consists of a magnetic band extending over one of the two opposite faces of the flat body, parallelly to the subject card, to an enlarged scale relative to Figs. 1 and 2 and seen from the opposite side of one of the major sides of said body.
- [0050] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0051] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0052] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0053] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0054] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0055] Fig. 8 shows the card in Fig. 4 in an assembled condition;
- [0056] Fig. 9 is a section taken along line XI-XI in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0057] Fig. 10 shows the structure of a flat support being supported card in accordance with the present invention;
- [0058] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0059] Fig. 12 is a section taken along line VII-VII in Fig. 2, showing a different embodiment of the invention;
- [0060] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0061] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0062] Fig. 15 is a second known type of card commercially available.
- [0063] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0064] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0065] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0066] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0067] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0068] Fig. 8 shows the card in Fig. 4 in an assembled condition;
- [0069] Fig. 9 is a section taken along line XI-XI in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0070] Fig. 10 shows the structure of a flat support being supported card in accordance with the present invention;
- [0071] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0072] Fig. 12 is a section taken along line VII-VII in Fig. 2, showing a different embodiment of the invention;
- [0073] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0074] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0075] Fig. 15 is a second known type of card commercially available.
- [0076] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0077] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0078] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0079] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0080] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0081] Fig. 8 shows the card in Fig. 4 in an assembled condition;
- [0082] Fig. 9 is a section taken along line XI-XI in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0083] Fig. 10 shows the structure of a flat support being supported card in accordance with the present invention;
- [0084] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0085] Fig. 12 is a section taken along line VII-VII in Fig. 2, showing a different embodiment of the invention;
- [0086] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0087] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0088] Fig. 15 is a second known type of card commercially available.
- [0089] Fig. 3 shows the structure of a flat support being supported card in accordance with the present invention;
- [0090] Fig. 4 is an exploded perspective top view of a support card in accordance with the invention;
- [0091] Fig. 5 shows the card in Fig. 4 in an assembled condition;
- [0092] Fig. 6 shows a flat support being part of the card shown in Figs. 4 and 5, to an enlarged scale.
- [0093] Fig. 7 is a section taken along line VII-VII in Fig. 2, showing coupling between a first memory unit and the flat support, in accordance with a preferred embodiment of the invention;
- [0094] Fig. 8 shows the card in Fig. 4 in an assembled condition;
- [0095] Fig. 9 is a section taken along line XI-XI in Fig. 5, showing a different embodiment for achieving coupling between the first memory unit and the flat support;
- [0096] Fig. 10 shows the structure of a flat support being supported card in accordance with the present invention;
- [0097] Fig. 11 shows the card in Fig. 4 in an assembled condition;
- [0098] Fig. 12 is a section taken along line VII-VII in Fig. 2, showing a different embodiment of the invention;
- [0099] Fig. 13 is an exploded perspective top view of a support card in accordance with the invention;
- [0100] Fig. 14 is an exploded perspective bottom view of a support card in accordance with the present invention;
- [0101] Fig. 15 is a second known type of card commercially available.

shaped type, i.e. it comprises a plate-like body 8 having a centering through hole 9 and at least one area 10 for data storage, preferably of the optical type, such disposed as to form an annulus extending concentric with the centering through hole 9 and substantially tangent to the major sides 3b of the flat support 2.

[0016] In particular, it is preferably provided for the first storage unit 7, or at least the plate-like body 8 thereof, to be essentially defined by a DVD (digital versatile disc) disc-half the outer diameter of which substantially corresponds to the size of the minor sides 3a of the flat support 2. To the ends of the present description, by "disc-half" it is intended one of the two disc-shaped elements that are usually coupled in mutual superposition relationship when DVDs following conventional techniques are made. In this connection please see document EP 866450 for further explanations and information on how DVDs are made.

[0017] The plate-like body 8 preferably has a circular conformation, delimited by an outer circumferential edge 8a, but the plate-like body may also have a different conformation, a quadrangular conformation for example, provided it is contained within the extension of the perimetral edge 3a, 3b of the flat support 2.

[0018] Disposed on the first face 4 of the flat support 2, at the through opening 6, is means for engagement of the first storage unit 7, preferably comprising a surface recess 11 formed on the first face itself. The surface recess 11 is able to house the first storage unit 7 when the latter, through a locating surface 7a thereof, is brought in abutment on the surface recess itself.

[0019] Preferably, the shape of the surface recess 11 matches that of the first storage unit 7 and its depth corresponds to the thickness of said storage unit. In this way the first storage unit 7, when housed in the surface recess 11, has a reading surface 7b disposed flush with the first face 4 of the flat support 2.

[0020] In particular, in the embodiment shown, the surface recess 11 has a circular conformation and is delimited by a circumferential ridge 12 substantially tangent to the major sides 3b of the flat support 2.

[0021] Advantageously, engagement of the first storage unit 7 with the flat support 2 further involves the aid of mechanical-interfacing means comprising a fitting element for example, for engagement between the storage unit itself and the support card 1, preferably in a removable manner.

[0022] This mechanical-interfacing means preferably comprises a collar 13 axially projecting from the locating surface 7a at the centering through hole 9 having an inner diameter corresponding to that of the centering hole usually provided in a conventional compact disc or DVD. Collar 13 defines a shoulder 13a facing away from the geometric axis of the through hole. Shoulder 13a is able to cooperate with an inner circumferential edge 6a of the through opening 6 to accomplish a tight mechanical-interference fit with said opening.

[0023] In a preferential embodiment shown in Fig. 7,

shoulder 13a of collar 13 has a substantially cylindrical conformation in the same manner as the inner circumferential edge 6a of the through opening 6. The outer diameter of collar 13 is slightly greater than the inner diameter of opening 6, so as to carry out a tight interference fit of the collar into the opening.

[0024] In accordance with an alternative embodiment shown in Fig. 8, it may be advantageously provided that shoulder 13a defined by collar 13 and/or the inner circumferential edge 6a of the through opening 6 should be of truncated conical form. In this manner shoulder 13a defines an undercut turned towards the flat body 8, whereas the inner circumferential edge 6a defines an undercut turned towards the second face 5 of the flat support 2. Due to the presence of these undercuts a mechanical-interference snap fitting of collar 13 in opening 6 occurs.

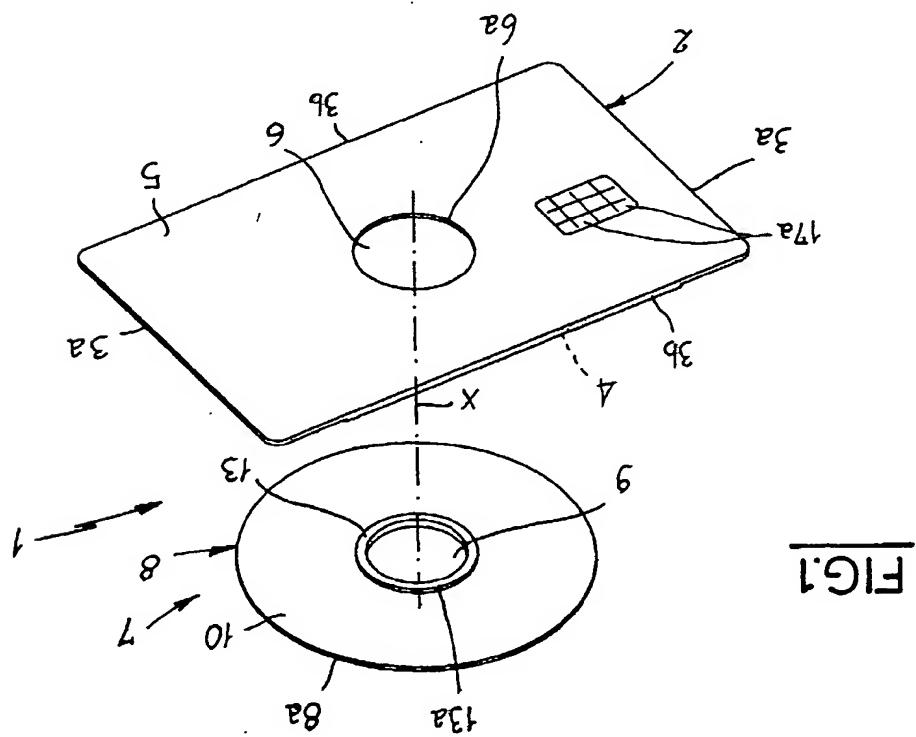
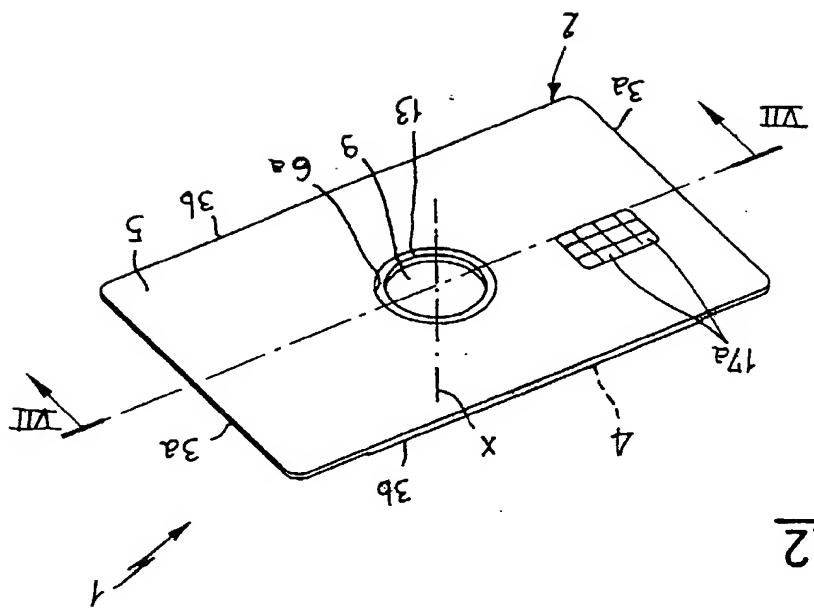
[0025] To make snap-fitting easier, radial cuts may be advantageously arranged at collar 13 and/or opening 6, which cuts divide the collar itself and/or the inner circumferential edge 6a into a plurality of elastically-deformable portions in the form of an arc of a circle.

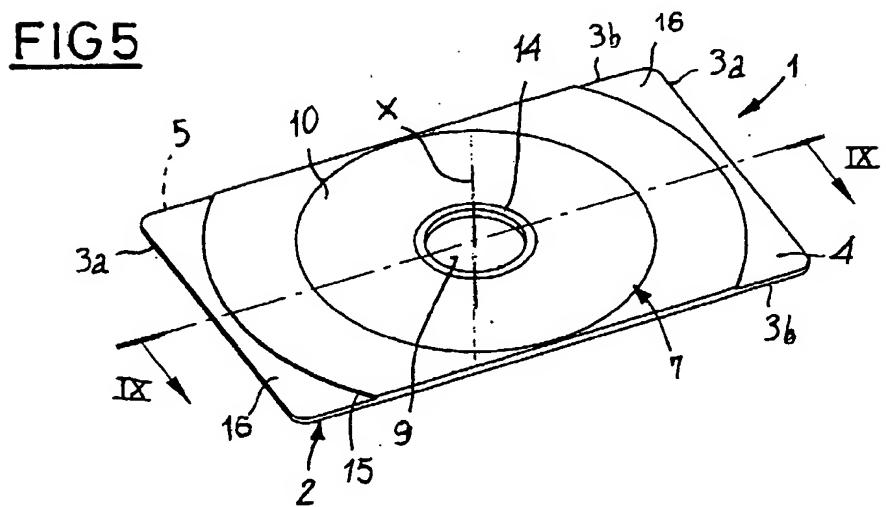
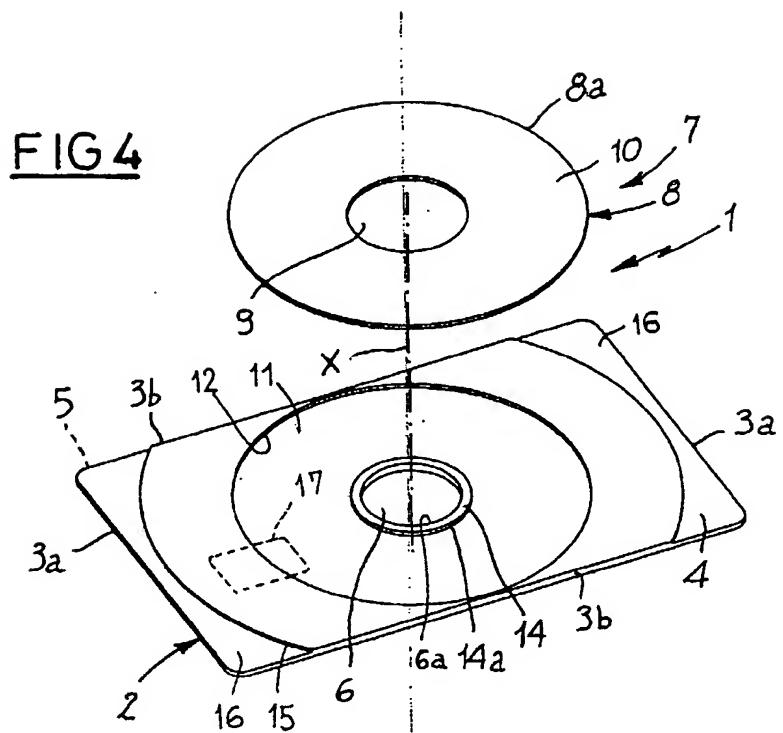
[0026] In a different embodiment, shown in Figs. 4, 5, 9 and 10, instead of collar 13 associated with the first memory unit 7 at least one grip lug 14 formed at the inner circumferential edge 6a of said through opening 6 is provided to be arranged. The grip lug 14, preferably having an annular conformation concentric with the through opening 6, defines a coupling ridge 14a facing away from the geometric axis X of the through opening 6, to engage, by interference fit, the centering hole 9 arranged in the first storage unit 7. In this embodiment, the through opening 6 will have the same inner diameter as the centering hole usually provided in compact discs or DVDs, whereas the centering hole 9 arranged in the first storage unit 7 will have a conveniently bigger diameter.

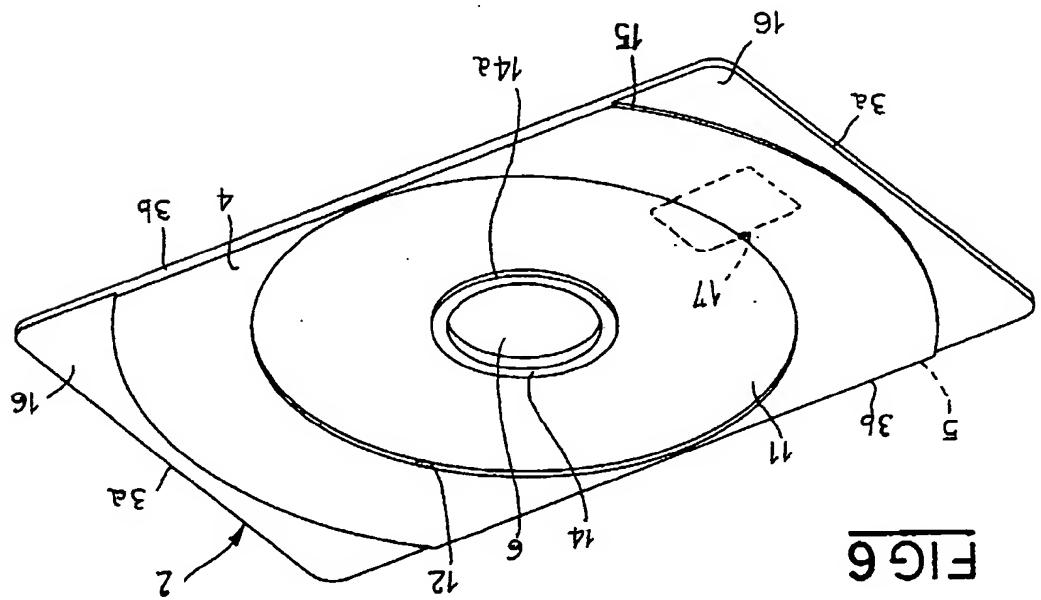
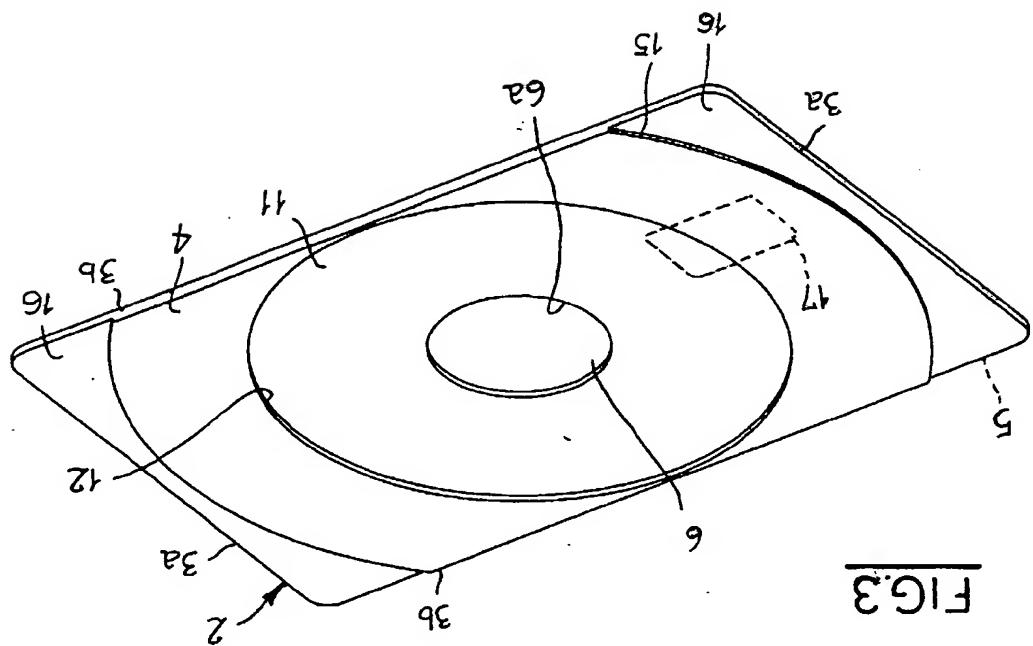
[0027] In this case too, both the grip lug 14 and the centering hole 9 may have a cylindrical configuration, with diameters slightly differentiated from each other to cause mutual coupling by forced fitting (Fig. 9). Alternatively, the grip lug 14 and/or centering hole 9 may be of truncated conical form as shown in Fig. 10, so as to define mutually opposite undercuts turned towards the second face 5 of the flat support 2 and the reading surface 7b of the first storage unit 7, respectively.

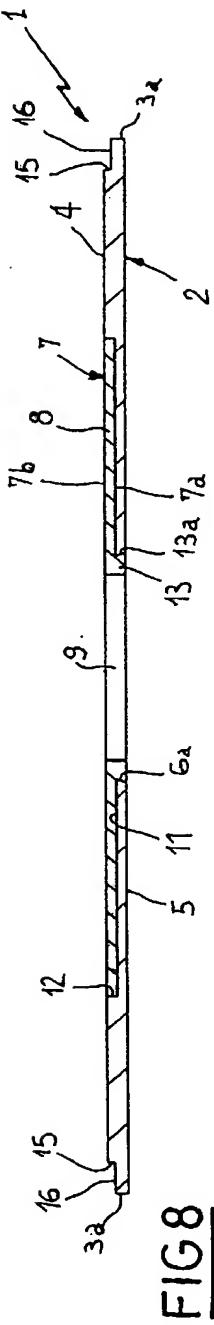
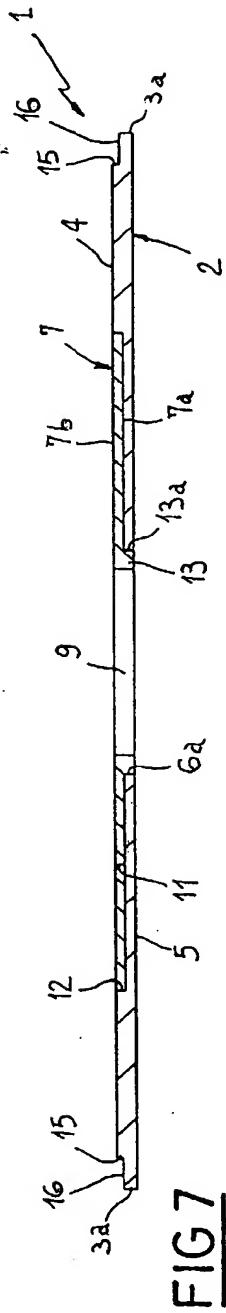
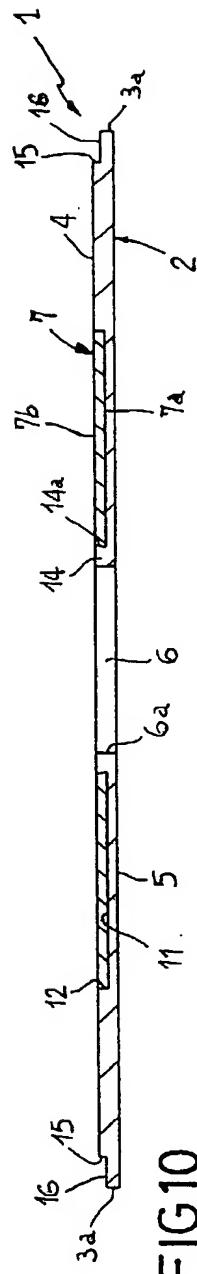
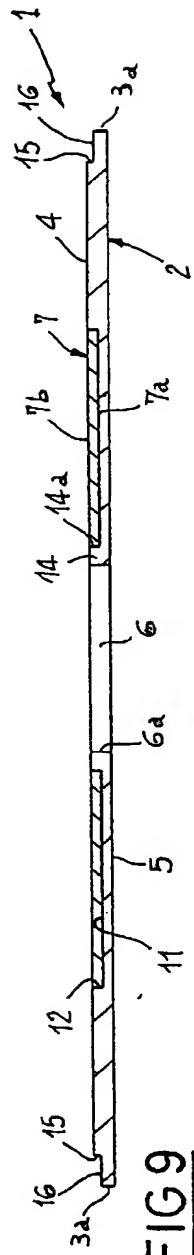
[0028] In addition to, or in place of collar 13 and/or the grip lug 14, the outer circumferential edge 8a of the plate-like body 8 and the circumferential ridge 12 of the surface recess 11 could be such arranged that mutual engagement by mechanical-interference fit will occur. Said outer circumferential edge 8a and circumferential ridge 12 may have a cylindrical configuration, with differentiated diameters to obtain forced coupling of the plate-like body 8 into the surface recess 11. Alternatively, the outer circumferential edge 8a and/or circumferential ridge 12 may have, at least as regards part of their circumferential extension, a frusto-conical conforma-

- ridge (14a) facing away from a geometric axis (X) of said through opening (6) to get engaged by interference fit in a centering hole (9) provided in said data storage unit (7).
10. A support card as claimed in claim 9, wherein said grip lug (14) has an annular conformation concentric with said through opening (6).
11. A support card as claimed in claim 9, wherein said coupling ridge (14a) forms an undercut turned towards the second face (5) of the flat support (2).
12. A support card as claimed in claim 1, further comprising another data storage unit (17) accessible from said second face of the flat support (2).
13. A support card as claimed in claim 12, wherein said further storage unit (17) is made in the form of a microchip incorporated in the flat support (2) and having contact elements (17a) appearing on said second face (5).
14. A support card as claimed in claim 1, wherein said through opening (6) is disposed concentric with the perimetral edge (3a, 3b) of the flat support (2).
15. A support card as claimed in claim 1, further comprising means for centering the flat support (2) in a reading device of said storage unit.
16. A support card as claimed in claim 15, wherein said centering means comprises centering shoulders defined by auxiliary surface recesses present in said first face (4) close to the minor sides (3a) of said perimetral edge of rectangular profile (3a, 3b).
17. A support card as claimed in claim 1, wherein said storage unit (7) comprises:
- a plate-like body (8) having a centering through hole (9);
 - at least one region (10) intended for data storage and extending concentric with said centering through hole (9);
 - mechanical-interfacing means (13) for engagement of said storage unit (7) on a support card (1).
18. A support card as claimed in claim 17, wherein said mechanical-interfacing means comprises at least one tight fitting element (13).
19. A support card as claimed in claim 17, wherein said mechanical-interfacing means comprises a collar (13) axially projecting at said centering through hole (9) and defining a shoulder (13a) facing away from a geometric axis of the through hole (9) and ar-
- ranged to get engaged by interference fit in said through opening (6).
- 5 20. A support card as claimed in claim 19, wherein said shoulder (13a) defines an undercut turned towards the plate-like body (8).
- 10 21. A support card as claimed in claim 17, wherein said mechanical-interfacing means comprises an edge of said centering through hole (9) arranged to engage by interference fit a grip lug (14) being part of said engagement means disposed on said first face (4) of the flat support (2).
- 15 22. A support card as claimed in claim 21, wherein the edge of said through hole (9) forms an undercut turned towards a reading face (7b) of said storage unit (7).
- 20 23. A support card as claimed in claim 17, wherein said mechanical-interfacing means comprises an outer circumferential edge (8a) of said plate-like body (8), arranged to engage by mechanical-interference fit with a circumferential ridge (12) presented by said flat support (2).
- 25 24. A support card as claimed in claim 23, wherein said outer circumferential edge (8a) defines an undercut turned towards a reading face (7b) of said plate-like body (8).
- 30 25. A support card as claimed in claim 17, wherein said plate-like body (8) is essentially defined by a DVD disc-half.
- 35
- 40
- 45
- 50
- 55









EP 99 83 0572

Application number:

EUROPEAN SEARCH REPORT

Office

Page 6



EP 1 083 563 A1

European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 83 0572

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.)
A	PATENT ABSTRACTS OF JAPAN vol. 009, no. 221 (P-386), 7 September 1985 (1985-09-07) & JP 60 079581 A (DAINIPPON INSATSU KK), 7 May 1985 (1985-05-07) * abstract *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 198 (P-476), 11 July 1986 (1986-07-11) & JP 61 039990 A (DAINIPPON PRINTING CO LTD), 26 February 1986 (1986-02-26) * abstract *	1	

The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
BERLIN	13 January 2000	Bernaś, Y	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earliest patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Patent document	Publication date	Patent family	member(s)	Filed in search report
JP 57212669 A	27-12-1982	1284510 C	09-10-1985	04-03-1985 54979 B
JP 60008546 B	04-03-1985	8492582 A	27-06-1982	AU 54979 B
JP 60008546 B	04-03-1985	1189616 A	25-06-1982	CA 1189616 A
JP 60008546 B	04-03-1985	3222844 A	27-01-1983	DE 3222844 A
JP 60008546 B	04-03-1985	2508220 A	24-12-1982	FR 2508220 A
JP 60008546 B	04-03-1985	2103862 A,B	23-02-1983	GB 2103862 A,B
JP 60008546 B	04-03-1985	8202480 A,B,C	17-01-1983	NL 8202480 A,B,C
JP 60008546 B	04-03-1985	8802984 A	03-04-1983	NL 8802984 A
JP 60008546 B	04-03-1985	4525758 A	25-06-1982	US 4525758 A
JP 60008546 B	04-03-1985	63228479 A	22-09-1988	JP 63228479 A
JP 60008546 B	04-03-1985	63106976 A	12-05-1988	JP 63106976 A
JP 60008546 B	04-03-1985	3750420 D	29-09-1994	DE 3750420 D
JP 60008546 B	04-03-1985	6036296 C	09-03-1995	JP 6036296 C
JP 60008546 B	04-03-1985	1911694 C	09-03-1995	JP 1911694 C
JP 62054881 A	10-03-1987	20-02-1990	US 4903256	JP 62054881 A
JP 62054881 A	10-03-1987	1180575 C	09-12-1983	JP 1180575 C
JP 62054881 A	10-03-1987	54019705 A	14-02-1983	JP 54019705 A
JP 62054881 A	10-03-1987	58008041 B	14-02-1983	JP 58008041 B
JP 62054881 A	10-03-1987	1190666 C	13-02-1984	JP 1190666 C
JP 62054881 A	10-03-1987	58023643 B	17-05-1983	JP 58023643 B
JP 62054881 A	10-03-1987	54019706 A	14-02-1984	JP 54019706 A
JP 62054881 A	10-03-1987	1177959 C	13-02-1984	JP 1177959 C
JP 62054881 A	10-03-1987	54019708 A	14-02-1983	JP 54019708 A
JP 62054881 A	10-03-1987	58008042 B	14-02-1983	JP 58008042 B
JP 62054881 A	10-03-1987	1177958 C	13-02-1983	JP 1177958 C
JP 62054881 A	10-03-1987	54019707 A	14-02-1983	JP 54019707 A
JP 62054881 A	10-03-1987	58008043 B	14-02-1983	JP 58008043 B
JP 62054881 A	10-03-1987	30-11-1983	30-11-1983	JP 30-11-1983
JP 62054881 A	10-03-1987	1177960 C	14-02-1983	JP 1177960 C
JP 62054881 A	10-03-1987	14-02-1983	14-02-1983	JP 14-02-1983
JP 62054881 A	10-03-1987	1177960 A	14-02-1983	JP 1177960 A
JP 62054881 A	10-03-1987	2830880 A	18-08-1981	DE 2830880 A
JP 62054881 A	10-03-1987	1106665 A	11-08-1981	CA 1106665 A
JP 62054881 A	10-03-1987	2397649 A	09-02-1979	FR 2397649 A
JP 62054881 A	10-03-1987	2001191 A,B	24-01-1979	GB 2001191 A,B
JP 62054881 A	10-03-1987	4195844 A	01-04-1980	US 4195844 A
JP 62054881 A	10-03-1987	27-06-1992	27-06-1992	AU 7586296 A
JP 62054881 A	10-03-1987	0864152 A	16-09-1998	EP 0864152 A
JP 62054881 A	10-03-1987	NONE	02-02-1996	JP 08031134 A

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.
The members are entitled in the European Patent Office to the above-mentioned European Patent report.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPÉEN PATENT APPLICATION NO.
EP 99 83 0572

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 83 0572

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-01-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 60079581 A	07-05-1985	NONE	
JP 61039990 A	26-02-1986	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

This Page Blank (uspto)

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.

This Page Blank (uspto)